Biogeosciences Discussions

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Comment on bg-2020-457

Anonymous Referee #1

Referee comment on "Pelagic primary production in the coastal Mediterranean Sea: variability, trends, and contribution to basin-scale budgets" by Paula Maria Salgado-Hernanz et al., Biogeosciences Discuss., https://doi.org/10.5194/bg-2020-457-RC1, 2021

This manuscript estimates total primary production in coastal regions of the Mediterranean Sea – looking at spatial and temporal variability in primary production in addition to comparing it against estimates of total primary production in the entire sea. The authors use CMEMS satellite data for the analysis and also estimate the ef ratio/new production from SST. They conclude that 12% of total carbon fixation in the Mediterranean occurs in coastal regions. They further show a decrease in primary production since 2012 which they say is linked to increasing SST and NAO/MOI although they do show different spatial and temporal trends within regions. The authors state that this is the first time that the contribution of the coastal zone on primary production has been estimated for the Mediterranean.

One of the things that struck me was the higher primary productivity (per m3) and chlorophyll data in the Eastern basin than Western basin which I found very surprising. Due to low river inputs in the Eastern Mediterranean compared to the Western Mediterranean I naturally would expect the Western Mediterranean coastal area to be more productive. I would like the authors to discuss this in more detail – is this due to the uncertainty/overestimation of chlorophyll in the Gulf of Gabes as mentioned by the authors or is there observational data to back up the high productivity here. Can the authors put any error estimates on this or give a lower bound on the Eastern value. Likewise can you really give a contribution of total primary production to the Mediterranean for coastal areas if the studies that estimated these total Mediterranean values exclude the highly productive coastal areas (i.e North Adriatic, Gulf of Gabes) as mentioned by the authors on Line 76 due to the high turbidity and thus inaccurate values. Alternatively is the CMEMS chlorophyll data corrected for these high turbidity areas, reducing the uncertainty in your estimates compared to previous studies like Bosc et al. 2004 and Bricaud et al., 2002 where these areas were excluded?

Following on from this I would like to ask the authors whether they have considered doing the analysis (with small adjustments) for the whole Mediterranean Sea so that comparison for coastal primary against the whole Mediterranean is coherent using data that has been

prepared in the same way. This would enhance their conclusions on the contribution of the coastal zone to primary productivity in the Mediterranean

Generally, the manuscript is well written and English is good. I do feel that the conclusions can be strengthened and it would be nice if the authors could specifically say how this dataset/analysis will be useful to the Mediterranean science community. If the authors address the comments I have made, I think this manuscript can be considered for publication in Biogeosciences. The attached supplement provides my detailed comments on the manuscript

Please also note the supplement to this comment:
https://bg.copernicus.org/preprints/bg-2020-457/bg-2020-457-RC1-supplement.pdf